REMARKS/ARGUMENTS

Claims 1-22 remain in the application. Claims 1, 6-9, 11, 13-15 and 18-21 are amended.

Information Disclosure Statement

The Examiner is thanked for acknowledging and reviewing the Information Disclosure Statement previously filed by the Applicant.

Claim Objections

Claims 8, 9, 11 and 13-18 were objected to because of various informalities. Claims 8, 9, 11 and 13 are amended herein to correct the informalities. No new matter is added.

Claim Rejections Under 35 USC § 112

Claim 6 was rejected for vagueness in reciting "the torsional flexure." Claim 6 is amended to clarify "the torsional flexure" as referring to the first and second torsional flexures.

Claim 7 was rejected for vagueness in reciting "the proof mass electrodes." Claim 7 is amended to clarify "the proof mass electrodes" as referring to the respective first and second pluralities of proof mass electrodes.

Claims 14 and 15 were rejected for vagueness in reciting "each of the torsional flexures." Claims 14 and 15 are amended to clarify "each of the torsional flexure" as referring to the one or more torsional flexures suspending each of the first and second pluralities of frame electrode fingers.

Claim 18 was rejected for failing to provide antecedent basis for "the torsional flexure." Claim 18 is amended to provide antecedent basis by clarifying "the torsional flexure" as referring to the one or more torsional flexures suspending each of the first and second pluralities of frame electrode fingers.

Claim 19 was rejected for failing to provide antecedent basis for "the in-line flexures." Claim 19 is amended to provide antecedent basis by clarifying "the in-line flexures" as referring to one or more in-line flexures coupled to the proof mass in line with the axis of symmetry.

Claims 20 and 21 were rejected for vagueness in reciting "the capacitor plates." Claims 20 and 21 are amended to clarify "the capacitor plates" as referring to the third and fourth sets of capacitor plates defined in base claim 19.

Claim Rejections Under 35 USC § 102

Claim 1 was rejected under 35 USC § 102(b) as being anticipated by US Patent 6,257,059 to Weinberg, et al.

The invention as originally presented in claim 1 is patentable over Weinberg which teaches an out-of-plane tuning fork gyroscope based upon a comb-drive accelerometer having a proof mass that are compliant in an axis parallel to the major plane of the substrate for translation along the axis in response to an angular rate or acceleration input about an axis normal to the substrate. The proof mass translation is sensed by electrode strips on the substrate. See, Brief Summary of the Invention at column 1, line 61-column 2, line 19.

Weinberg describes the prior-art in-plane tuning fork gyroscope as having two proof masses 10 having combs 12, 14. The proof masses 10 and combs 12, 14 are supported on an assembly including flexures 18 connecting the proof masses 10 to the supporting beams 16, and flexures 20 that connect the supporting beams 16 to a substrate 22 at anchor points 24. Column 2, line 66-column 3, line 11.

The proof masses 10 vibrate in opposition along a drive axis 30 shown in Figure 1 as being in the plane of the substrate 22. Column 3, lines 12-17.

Coriolis forces move one proof mass 10 up and the other down along an output motion axis that is normal to the substrate 22. The motion of each proof mass 10 causes a change in the capacitance between the proof mass 10 and a corresponding aligned electrode plate 34L, 34R that are mounted on the substrate 22. Column 3, lines 21-26.

In Figure 2 Weinberg then teaches the elements of an out-of-plane tuning fork gyroscope that correspond to similar elements of the prior art in-plane gyroscope of FIG. 1. The gyroscope of FIG. 2 employs a striped capacitor readout in place of the plates 34L, 34R of the prior art. The striped capacitor readout includes electrodes formed in paired strips 42, 43 on the substrate 22. The electrode strips 42, 43 are formed parallel to the drive axis 30 below the proof masses 10. Column 3, lines 42-57.

The structure shown by Weinberg in FIG. 2 is compliant along a Z axis 44 that is parallel to the substrate 22. An angular rate about an input axis 38 that is orthogonal to the substrate causes one proof mass to translate along +Z and the other along -Z. This axial motion causes changes in the capacitance between the capacitor strips 42, 43 on the substrate and the proof masses 10 as the apertures 40 cover the strips 42, 43 to varying relative degrees. Column 3, line 58-column 4, line 12.

Thus, Weinberg teaches proof masses 10 that vibrate in opposition along a drive axis 30 in the plane of the substrate 22 (column 3, lines 12-17) as well as move up and the other down along an output motion axis that is normal to the substrate 22 (column 3, lines 21-26). Weinberg also teaches proof masses 10 that translate along a Z axis 44 that is parallel to the substrate 22. Column 3, line 58-column 4, line 12.

Weinberg teaches the corresponding electrode plates 34L, 34R of the prior art being mounted on the substrate 22. Column 3, lines 21-26. Weinberg also teaches the paired electrode strips 42, 43 of the striped capacitor readout being formed on the substrate 22 parallel to the in-plane drive axis 30. Column 3, lines 42-57.

The present invention recited in claim 1 is a device for measuring an applied force having third and fourth pluralities of spaced apart capacitor plates that are intermeshed respectively with the first and second pluralities of proof mass capacitor plates, the third and fourth pluralities of capacitor plates being suspended for rotational motion relative to the frame about respective first and second axes of rotation oriented substantially parallel with an axis of symmetry of the proof mass.

At least because the third and fourth pluralities of capacitor plates of the invention are suspended for rotational motion relative to the frame, the invention currently recited in claim 1 is patentable over Weinberg.

As discussed above, Weinberg fails to teach any capacitor plates that are suspended for rotational motion relative to the frame. Rather, in contrast to the present invention, Weinberg teaches the proof masses 10 being suspended only for translation relative to the substrate 22.

Furthermore, as taught by Weinberg, both the reference electrode plates 34L, 34R of the prior art and the reference electrode strips 42, 43 are formed on the substrate 22, and therefore do not have any motion of any kind relative to the substrate 22.

Weinberg therefore fails to anticipate the third and fourth pluralities of reference capacitor plates being suspended for any motion relative to the frame, as originally recited in claim 1.

Furthermore, Weinberg fails to anticipate the third and fourth pluralities of reference capacitor plates being suspended specifically for rotational motion relative to the frame, as currently recited in claim 1.

The current amendment to claim 1 is therefore believed to be unnecessary for allowance. Rather, the current amendment to claim 1 is intended only to clarify the invention.

For at least the above reasons, claim 1 is believed to be allowable over Weinberg.

Allowable Subject Matter

The Examiner is thanked for notifying the Applicant that claims 2-5 contain allowable subject matter and would be allowable if rewritten in independent format. However, as discussed herein, the Applicant believes claim 1 to be allowable. Therefore, the Applicant declines at this time to rewrite claims 2-5 independently of base claim 1.

The claims now being in form for allowance, reconsideration and allowance is respectfully requested.

If the Examiner has questions or wishes to discuss any aspect of the case, the Examiner is encouraged to contact the undersigned at the telephone number given below.

Respectfully submitted,

Attorney: Charles J. Rupnick
Registration No.: 43,068
Date: November 2, 2004
Post Office Address: PO Box 46752
Seattle, WA 98146
Telephone: (206) 439-7956
Facsimile: (206) 439-3223